Screening and dereplication of microbial natural products extracts

Månsson, Maria; Vynne, Nikolaj Grønnegaard; Wietz, Matthias; Gram, Lone; Nielsen, Kristian Fog; Larsen, Thomas Ostenfeld

Publication date:
2011

Document Version
Early version, also known as pre-print

SCREENING AND DEREPLICATION OF MICROBIAL NATURAL PRODUCTS EXTRACTS

Maria Månsson[1], Nikolaj G. Vynne[2], Matthias Wietz[2], Lone Gram[2], Kristian F. Nielsen[1] and Thomas O. Larsen[1]

[1]Department of Systems Biology, Technical University of Denmark [2]National Food Institute, Technical University of Denmark

Cosmopolitan occurrence of a lot of antibiotics and other bioactives among microorganisms, stresses the need for efficient of dynamic screening and dereplication methods to avoid redundancy in isolation of compounds. Exploring our large collection of marine bacteria collected during the Galathea 3 expedition,[1] we use a combination of chemical profiling[2] and explorative solid-phase extraction (E-SPE)[3] to assess the bacteria's potential to produce new and interesting molecules. We found the use of chemical profiling by LC-UV/MS very useful for marine bacteria such as *Vibrio*[4] and *Pseudoalteromonas*.[5] It enabled the grouping of similar strains at species and subspecies level disregarding geographical sampling locations. However, intraspecies differences were still observed. In *P. luteoviolacea*[5] and *V. coralliilyticus*[6] some of the differences were related to the production of antibacterial compounds. The chemical profile could be linked to a bioactivity profile using E-SPE,[3] which through the use of three different ion-exchangers and a size-exclusion column gives information about the charge, size, and polarity of active components in an extract. This can be used to discriminate between possible candidates during dereplication and allows detailed mapping of bioactives.

1) Gram et al. *Mar. Biotechnol.* **2010,** 12(4):439-451; 2) Larsen et al. *Nat. Prod. Rep.* **2005,** 22(6):672-695; 3) Månsson et al. *J. Nat. Prod.* **2010,** 73(6):1126-1132; 4) Wietz et al. *Mar. Drugs* **2010,** 8(12):2946-2960; 5) Vynne et al. *Mar. Biotechnol.* **2011,** *in press*; 6) Wietz et al. *Environ. Microbiol Rep.* **2011**, *in press.*